

### 3.0 ELEMENTS OF AN EMS AT EACH UTC FACILITY

This section presents information about the elements of an EMS<sup>1</sup> at each facility, as indicated by responses to the pre- and post-EMS surveys, which provide information about conditions at UTC facilities in 1990 and in 1998, respectively. For the project, 12 general elements of an EMS were identified. Further, 90 specific elements were identified under the general elements. The blank survey documents included as Appendix B to this report contain all of the elements of an EMS used for this project.

Very few of the elements of an EMS (less than 10 percent of the elements, on average) were present at all eight participating UTC facilities in 1990. UTC initiated implementation of its Management Systems Improvement Plan (MSIP) in March 1996. In 1998, two years after implementation of the MSIP, a substantial majority of the elements of an EMS (more than 90 percent, on average) were present at all eight participating UTC facilities. Table 2 depicts the relative number of EMS elements present in 1990 and 1998 at participating UTC facilities. In parentheses in the first column of the table, the table shows the total number of specific elements under each general element. The table also shows the number of specific elements under each general element indicated in the pre-EMS surveys (represented by the first number in each two-number set, set forth as X/X, in the table) and in the post-EMS surveys (the second number in each two-number set). The following subsections describe the elements of an EMS present at UTC facilities in 1990 and in 1998.

The table is accompanied by a graph, Figure 1, showing changes in the number of elements present in terms of the percentage of EMS elements implemented, with the number of elements present in 1990 and the number present in 1998 averaged for the eight facilities.

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<sup>1</sup> The definition (required elements) of an EMS varies depending on the source of that definition. However, during the development of the survey, EPA and UTC made an effort to include (1) all relevant elements from a variety of available definitions; and (2) the elements specified in UTC's Standard Practice 001, which defines required elements of an EMS for that corporation.

**TABLE 2**  
**ELEMENTS OF AN EMS PRESENT AT PARTICIPATING UTC FACILITIES**  
**IN 1990 AND 1998**

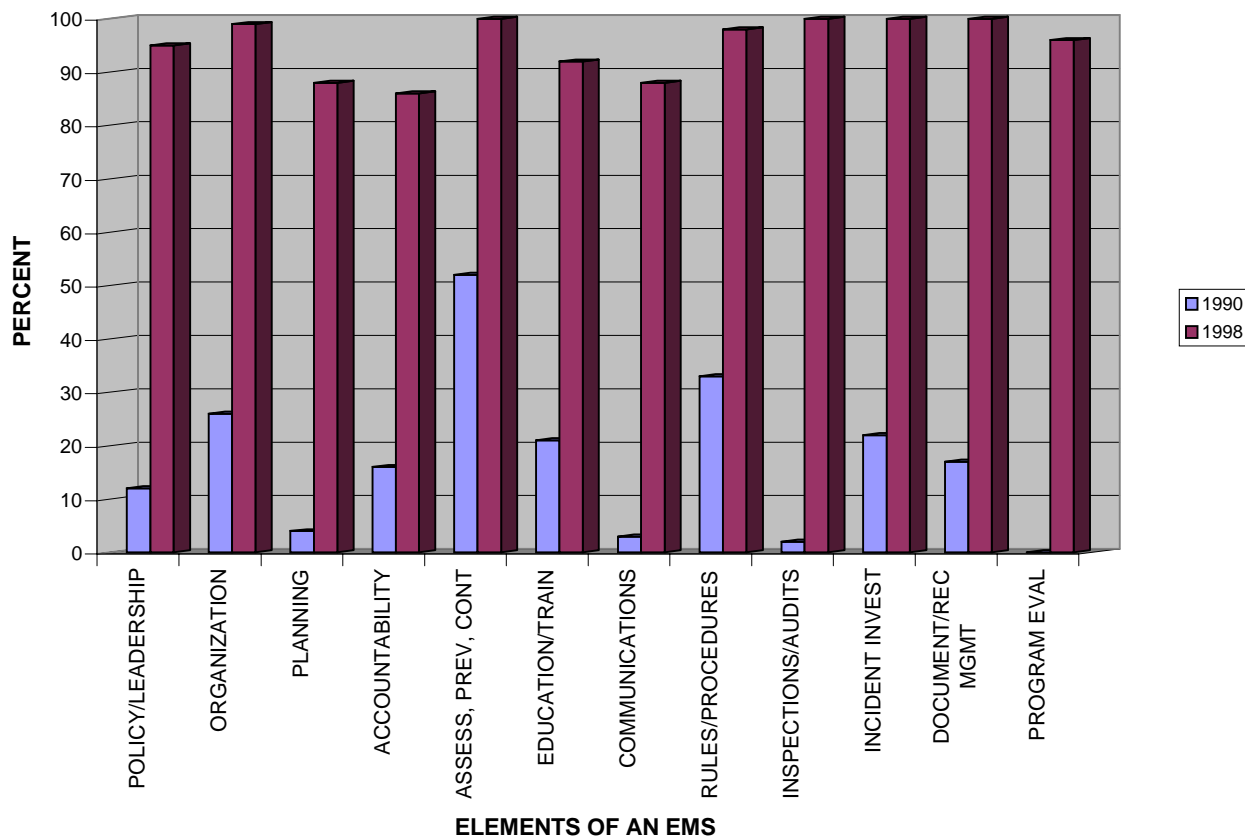
General Elements of an EMS	Hamilton Sundstrand	P&W Colt Street	P&W East Hartford	P&W Middletown	P&W North Haven	P&W Rocky Hill	Sikorsky Stratford	UTRC
Policy and Leadership (17)	0/17	4/17	4/16	1/16	1/15	0/16	2/16	4/16
Organization (17)	2/17	9/17	9/17	1/16	3/17	1/16	1/17	9/17
Planning (6)	0/6	0/5	0/5	0/5	0/5	0/5	0/6	2/5
Accountability (7)	0/7	3/7	3/7	0/4	0/7	0/4	0/6	3/7
Assessment, Prevention, and Control (7)	4/7	4/7	4/7	3/7	3/7	4/7	3/7	4/7
Education and Training (6)	3/6	2/5	2/5	0/5	0/6	0/5	1/6	2/6
Communication (5)	1/5	0/5	0/5	0/3	0/5	0/4	0/3	0/5
Rules and Procedures (5)	1/5	4/5	4/5	0/5	0/5	0/4	0/5	4/5
Inspections and Audits (7)	1/7	0/7	0/7	0/7	0/7	0/7	0/7	0/7
Incident Investigations (4)	1/4	2/4	2/4	0/4	0/4	0/4	0/4	2/4
Documents and Record Management (3)	1/3	1/3	1/3	0/3	0/3	0/3	0/3	1/3
Program Evaluation (6)	0/6	0/6	0/6	0/5	0/6	0/5	0/6	0/6

### 3.1 Elements of an EMS Present in 1990

The pre-EMS survey requested information about each facility's practices in 1990 related to specific elements of an EMS, as defined for this project and as set forth in section 1 of both the pre-EMS and the post-EMS survey (blank copies of the surveys are included in this report as Appendix B). All eight facilities had some elements of an EMS in place in 1990.

According to the pre-EMS surveys, the elements of an EMS that were present in 1990 often were required explicitly under existing environmental or health and safety regulations. Examples of such requirements include training regulations set forth under 40 Code of Federal Regulations (CFR) 265.16, which requires training for the management of hazardous waste and 29 CFR 1910.120, which requires health and safety training for persons who work at hazardous waste management and cleanup sites.

**Figure 1. Average Percentage of Elements of An EMS Present**



The elements of an EMS most commonly present in 1990 at the eight facilities that responded to the survey included (the number of facilities that had the element in place is shown in parentheses):

- Employee medical program (8)
- Emergency planning and response capability (8)
- Environmental, health, and safety (EH&S) technical staff available to provide technical consulting or advice (8)
- Written emergency action plan (7)
- Preventive maintenance program for pollution control equipment (6)
- Written EH&S policy or mission statement (6)

The corporate EMS survey also requested information from UTC's corporate office about the elements of an EMS that were present in 1990. According to UTC's responses in the corporate survey, elements of an EMS that should have been present (i.e., were required by corporate policy) at participating facilities in 1990 also included:

- An environmental policy statement
- Involvement of top management in setting goals and expectations for environmental performance
- A system in place for reviewing environmental procedures and updating them as necessary
- A system in place for tracking and interpreting new regulations and updating the policies and directives of the facility as necessary
- Emergency response procedures
- A preventive maintenance program for pollution control equipment
- A designated point of contact for records management
- Documented review to address possible need for changes in policy, objectives, and other elements of the EMS

It should be noted that the responses to the corporate survey were more broad (that is, included more elements of an EMS) than were the responses for the individual facilities. For example, in 1990, a designated point of contact for records management was identified as an element of an EMS in the corporate survey but was not indicated as an element of an EMS present in any of the pre-EMS surveys of individual facilities. This potential inconsistency may indicate that corporate policy was not being communicated effectively to or fully implemented at all participating UTC facilities in 1990.

### **3.2 Elements of an EMS Present in 1998**

In the 1998 survey, all eight facilities that responded to the post-EMS survey indicated the presence of nearly all the elements of an EMS, as defined for this project. The following elements were not included in UTC's EMS as of 1998 (the number of facilities that did not have the specified element in place is shown in parentheses):

- Mandatory training program in place that includes EH&S policy and provides specific EH&S requirements that are conditions of employment (4)
- Documented communications plan in place for external communication of EH&S issues and information (3)
- Communication of EH&S policy to all customers (3)
- Written annual EH&S plan incorporated into the overall business plan of the operation (3)

The elements of an EMS most often missing in 1998, according to the surveys, can be grouped into two major categories: (1) incorporation of EMS policies and procedures into the overall "business plan" of the individual facility and (2) a communications plan in place for external communication of EH&S issues. Development of those elements may increase awareness of EH&S issues, both internally and externally, and may help bring about improvements in regulatory compliance and environmental performance.

### **4.0 PRESENTATION OF UTC'S COMPLIANCE STATUS AND THE ROOT AND CONTRIBUTING CAUSES OF NONCOMPLIANCE IN 1990 AND IN 1998**

This section describes the types of noncompliance identified at UTC facilities before 1990 (as indicated by the 1993 complaint and summarized by Tetra Tech in the pre-EMS profiles) and in 1998 (as indicated by the results of third-party audits conducted in 1997 and 1998 [hereafter